

# Potential Transportation Pathways in India

Ranjan Kumar Bose, Ph.D.  
Senior Fellow, Centre for Urban Systems and Infrastructure  
TERI (The Energy and Resources Institute), New Delhi 110019, India  
[E-mail: [rbose@teri.res.in](mailto:rbose@teri.res.in)]

## Abstract

Transport plays a significant role in the overall development of nation's economy. However, this sector also accounts for a substantial and growing proportion of air pollution in cities. The sector contributes significantly to the emissions of greenhouse gases and is also a major consumer of petroleum fuels. Almost half of the total consumption of petroleum products in India is attributed to the transport sector, mostly in the form of HSD (high-speed diesel) and gasoline. The presentation begins with analysis of the transport sector energy demand and the trends in travel demand (for goods and passenger movement) and the services provided through several modes namely, road, rail, inland waterways, coastal shipping, and pipelines. Air transport has been ignored because it has limited environmental impacts in terms of criteria pollutants and it forms only a small proportion of the total travel demand. Future travel demand projections are made for the two dominant modes, road and rail, till the year 2036. The presentation identifies the directions and suggests the strategies for promoting sustainable development of the sector. For the sake of convenience, the directions for change are discussed separately under regional and national transport, and under urban and suburban transport. Changing the modal shares in freight transport forms the dominant portion of the recommended strategies for long-distance transport. This is supplemented with a two-pronged approach—to reduce the number of vehicles on the roads and to reduce the emissions from each vehicle—aimed at reducing congestion and pollution in urban areas. Assumptions made for such interventions are highlighted before presenting the impacts of the suggested interventions on transport energy demand and carbon emissions for two reference years, 2019 and 2047, under business-as-usual (high carbon emissions) and alternative (low carbon emissions) scenarios. In addition, results of two city specific case studies—Delhi and Bangalore—are presented to illustrate the carbon mitigation potential from urban transport sector. Two important observations stand out. First, under any plausible scenario, greenhouse gases will soar. Second, although these increases are disconcerting, they indicate that pursuit of the lower greenhouse gas path leads to far fewer emissions of criteria pollutants — and much lower transport and energy costs. Finally, a list of strategies is recommended to reduce the fastest growing emissions from the transportation sector and identifies possible areas for international cooperation.